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# Educational Workshop in Microbiology

## *A Home-Study Approach*

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THE TRADITIONAL PROCEDURE for training courses in bacteriology consists of 10 to 30 persons working for 1 or 2 weeks, depending on the subject, in a special laboratory that has all the necessary facilities and materials, including various media, reagents, instruments, and cultures or organisms. The participants work on the specimens in this laboratory and usually attend a lecture for part of each day. The disadvantages of such a workshop are: (a) only a limited number of persons can be accepted, (b) the participants use facilities, media, and reagents prepared for them by the training institution, and not all may be able to continue to use such materials in their own laboratories, and (c) the participants' travel and lodging expenses are a burden to the institutions.

An individual approach to continuing education of laboratory personnel in small communities and remote areas also has been at-

tempted (1, 2). In that project, the staffs from 90 hospital laboratories were trained on a 1 to 1 basis in 18 established centers for 5 to 15 days. The project, which lasted 5½ years, reimbursed the trainees for per diem and transportation expenses and paid the training center stipend. This was a costly program for training laboratory personnel, 51 percent of whom had had less than 1 year of formal training.

Another kind of workshop commonly presented is 1 to 2 days of lectures and demonstrations. In this method, the participants usually do not work with the organisms.

In a fourth approach, the American Society of Clinical Pathologists Commission on Continuing Education sends 6–10 samples each year to laboratories enrolled in its program. The participants save their findings and compare them with the critiques, which they receive later. Unfortunately,

this program is case oriented and directed mainly to decision making rather than to practical bench training. It has a limited scope because only one organism is usually sent and discussed each time, rather than a group of organisms representing a major area of microbiology. Moreover, the participants do not have the benefit of interacting with the faculty or observing proper and up-to-date methodology and equipment.

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Culture No:		Isolate No. of		Identified As:	
Date Rec'd:		Date Rep't:		Sender:	
Patient:		Age:		Sex:	
				Source:	

  

ENVIRONMENT		COLONY MORPHOLOGY			ABBR:		CELL MORPHOLOGY			GROWTH IN BROTH		
Date:		Date:	Days:		Date:	Days:		Date:		Days:		
Growth Temp:		Media:			Media:			Media:				
Media:		Colony Size:	Minute Small Moderate Large		Gram: Pos Neg Var			Cocci: Coccobacilli Bacilli				
		Hemolysis:	Alpha Beta None		Pairs Clusters Chains			Small Medium Large				
Anaerobic	Days	Color:	Absent Present		Curved Pleomorphic			Clumped Vacuolated				
No Growth		Odor:	Dry Glistening Matte		Straight Thin			Free				
Aerobic	Days	Form	Elevation Margin		Spores:			Terminal Oval				
No Growth		Punctiform	Flat Entire		Terminal Oval			Subterminal Round				
CO <sub>2</sub>	Days	Circular	Raised Undulate		Free							
Growth		Filamentous	Convex Lobate									
No Growth		Irregular	Pulvinate Erode									
		Rhizoid	Umbonate Filamentous									
		Spindle	Umbilicate Curled									
			Pitted									

  

CARBOHYDRATE UTILIZATION				BIOCHEMICAL REACTIONS				EGG YOLK AGAR				TOXIN NEUTRALIZATION			
Date:				Date:				Lipase				Date:	Animal:		
Base Control				Motility				Lecithinase				Dose/Route			
Glucose				Indol				Gas Liquid Chromatography				No.	Serum/Food	D	S
Maltose				Gelatin				LD	LDG			Control			
Mannitol				Catalase				Volatile	Volatile						
Lactose				Esculin											
Sucrose				Nitrate Reduction	Reagent Zinc										
Xylose				Urease				Non-Vol.	Non-Vol.						
Salicin				20% Bile											
Arabinose				H <sub>2</sub> S Med											
Glycerol				Cooked Meat											
Rhamnose															
Trehalose				Milk											

ANAEROBIC RECORD CARD

7/6/76

Worksheet supplied to participants for use in identifying the 10 unknown isolates. This form is a slightly modified version of that used in the 1976 workshop.

## New Approach

New York State's clinical laboratory improvement program is directed at monitoring and licensing of laboratories, as well as at continuing educational programs in areas of demand or demonstrated deficiencies. The wet workshop in bacteriology has consistently attracted more applicants than could be accepted because of limited space, equipment, and staff. A new two-part format was therefore devised—first a practical exercise performed in the participants' own laboratories, and later a 1-day presentation, which is offered on different days in three locations across the State.

This format was first attempted

in May 1974 in a workshop on nonfermentative gram-negative bacteria. The 1-day presentations were held on Long Island, in Syracuse, and in Buffalo and were attended by 187 persons representing 127 laboratories. The participants responded favorably to the workshop, as reflected in their answers to a questionnaire. More important, the training course resulted in a wide interest in this group of bacteria, as was evident by the increasing number of organisms sent to our general bacteriology laboratory for confirmation or identification. In the year following the workshop, the number of isolates from this group increased by 39 percent, while the total of all other categories was

virtually unchanged (up 1.3 percent).

The same format was used in April 1976 in a workshop on clinical anaerobic bacteria. A total of 405 persons representing 228 institutions attended the 1-day presentations in New York City, Albany, and Rochester. The New York City workshop was a joint effort with Dr. Marion Wilson of the New York City Bureau of Laboratories. Dr. V. R. Dowell, Jr., of the Center for Disease Control (CDC), Atlanta, Ga., was guest speaker at all three locations; and Anna May Lee and Robert Meidenbauer of our bacteriology laboratory staff participated in demonstrating and in the preparation of the workshop.

The participants in both workshops were mainly from laboratories large enough to perform tests for both nonfermentative and anaerobic bacteria.

### The 1976 Workshop

The 1976 workshop on clinical anaerobic bacteriology was announced 3½ months before the scheduled 1-day meetings. Several weeks before the meetings, those selected as participants were sent detailed information about the workshop, lists of recommended media and methods for anaerobic culture, the CDC Manual on Laboratory Methods in Anaerobic Bacteriology (3), and other pertinent information.

Three weeks before the meetings, 10 cultures were sent as "unknowns" to each participant for identification. The organisms were *Clostridium ramosum*, *C. perfringens*, *C. septicum*, *Bacteroides fragilis* subsp. *fragilis*, *Fusobacterium mortiferum*, *F. nucleatum*, *Bifidobacterium eriksonii*, *Eubacterium limosum*, *Propionibacterium acnes*, and *Peptostreptococcus anaerobius*. Worksheets were also provided (a modified version is shown here).

The participants thus arrived at the 1-day meetings with a shared experience—that of trying to identify, under their individual laboratory conditions, the same 10 unknown anaerobic isolates. The publications distributed at the meeting included materials by Dowell and Lombard (4) and by Thornsberry (5) of the CDC; by Bartlett and associates (6) for the Upjohn Company; and by workers in our division. Several of these papers, as well as original material prepared by the workshop staff, were made available in the workshop manual, Clinical Anaerobic Bacteriology (7), which was given to each participant.

At each meeting, the morning session was devoted to lectures and the early afternoon session to a discussion of the participants' findings on the bacterial cultures sent them. Following the discussion, the participants were divided alphabetically into equal groups for various half-hour demonstrations; by rotation, each group could observe all the demonstrations. One demonstration depicted the morphologic and biochemical characteristics of the unknown isolates. When appropriate, representatives of Fisher Scientific Company and Kontes, Inc., demonstrated the use of new instruments and materials. The last hour of the day was spent in a roundtable discussion of common problems associated with the subject of the workshop.

### Questionnaire and Results

On arrival, each participant was given a questionnaire and asked to complete it before leaving the workshop. The questionnaire was to assist us in determining the value of the workshop and to give us some information regarding the educational background of the participants and the methods used in their laboratories. The participants were not asked to sign the questionnaire or to identify their laboratories.

Questionnaires were returned by 72 percent of the participants; nearly one-third of these were medical technologists registered by the Board of Registry of the American Society of Clinical Pathologists. More than one-fifth held a bachelor of science degree, and about one-tenth held either a master of science or a bachelor of arts degree. There were also a few PhDs (4.6 percent) and MDs (3.5 percent).

More than 98 percent of the respondents planned to use what

they had learned from the workshop in their own laboratories.

### Conclusion

This approach was especially designed to encourage the participants to use the workshop training in their own laboratories. The 1976 workshop reached a large number of laboratory personnel from clinical bacteriology laboratories in New York State, at a minimal cost to the State and to the participating institutions. The workshop provided practical training without disrupting the work of small laboratories, which need this continuing education but cannot afford to lose the service of one or more technicians for extended periods.

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